

ABSTRACT

A logical element including an optical junction coupled to at least two optical inlets and to at least one optical outlet. Incoming light beams of coherent monochromatic light beams and the same uniform frequency are applied to the optical inlets, and their super-positioning is provided as an outgoing light beam(s) via the optical outlet to another logical element or to a light intensity gauge. The light intensity gauge measures light intensity in specific zone(s) of an interference pattern created by the outgoing light beam, dependent on phase shift difference between the components of the incoming light beams, and the measured intensity is correlated with intensity ranges predetermined to conjugate to logical integer values, such as Boolean or other integer numeric values. A multiplicity of logical elements can be installed to provide an optical processor. Parallel use of the same logical element is provided by the simultaneous application of sets of light beams. The sets do not interact with each other by means of differing characteristics, such as different frequencies, or polarizations of the sets. A corresponding method is also provided.